Type: Invited Presentation

Final Abstract Number: 31.001
Session: Gender Differences in Infectious Diseases
Date: Saturday, April 5, 2014
Time: 10:15-12:15
Room: Room 1.60

Sex differences in immune responses to vaccines

F. Noho-Konteh[1], J. Adetifa[1], M. Cox[1], T. Forster[2], A. Drammeh[1], J. Njie-Jobe[1], D. Jeffries[1], M. Plebanski[3], P. Ghazal[2], P. Dickinson[2], H. Whittle[1], S. Rowland-Jones[4], J. Sutherland[1], K. Flanagan[5,*]

[1] *MRC Laboratories, Banjul, Gambia*
[2] *University of Edinburgh Medical School, Edinburgh, United Kingdom*
[3] *Monash University, Melbourne, Australia*
[4] *University of Oxford, Oxford, United Kingdom*
[5] *Monash University, Melbourne, TAS, Australia*

Sex differences in susceptibility to infections, and their clinical course and outcome, have been well described in the literature. Thus adult females generally mount more pronounced pro-inflammatory innate and adaptive immune responses to viral and bacterial infections than males, and generally males have poorer outcomes in bacterial septic shock. Despite this, few studies consider the effect of sex when analysing responses to vaccines. Females have been shown to mount stronger humoral responses to vaccines compared to males and have higher rates of adverse reactions. Additionally, adult females have been shown to up-regulate more innate immune response genes following yellow fever vaccination than males. The paucity of literature, particularly in regards to infant immunity, prompted us to examine the influence of sex on vaccine responses in more detail. We conducted a series of immunological vaccine studies in infants living in The Gambia, West Africa. We analysed for sex differences in the immunological profiles following administration of measles vaccine (MV) or diphtheria, tetanus, whole cells pertussis combined vaccine (DTwP) to nine month old infants. Assays included whole human transcriptional profile analysis, vaccine antibodies, *in vitro* cytokine release in response to innate stimuli or cognate antigens, as well as intracellular cytokine staining to enumerate polyfunctional T cells. There were clear sex differences in post-vaccine immunity for most of the parameters tested. Generally, male infants had more pro-inflammatory innate and adaptive immune response profiles compared to females of the same age. The sexes differed in their transcriptional profiles following vaccination, with distinct sets of genes being differentially expressed. By contrast, vaccine induced antibody responses to MV and DTwP were equivalent in male and female infants. The observation of sex differences in the immune responses elicited by vaccines has a number of important implications. It suggests that sex should be taken into account in vaccine studies; particularly for novel vaccines and in vaccine safety trials. Failing to do so may miss important data. The mechanisms are not yet known, but differences in sex hormone levels and expression of X-linked immune responses and microRNAs genes may be involved.

http://dx.doi.org/10.1016/j.ijid.2014.03.556

Type: Invited Presentation

Final Abstract Number: 31.002
Session: Gender Differences in Infectious Diseases
Date: Saturday, April 5, 2014
Time: 10:15-12:15
Room: Room 1.60

Sex discrepancies in vector-borne infectious diseases

P. Schlagenhauf

University of Zürich, Zurich, Switzerland

Infectious diseases occur disproportionately in men and women. Furthermore, the severity and outcome of infections are often sex-related. What are the underlying factors for these discrepancies? Some studies have pinpointed a marked sex difference in immune response. Females typically develop stronger innate, cell-mediated and humoral immune responses with fluctuations according to hormonal levels that vary naturally during the menstrual cycle, pregnancy, menopause or with the use of hormones as contraceptives or hormone replacement therapy. Male sex hormones have been implicated in immunoregulation. Testosterone causes a decline in certain immune responses and young men are often at greater risk of severe infections compared to women or older men. The hormonal household and the skin chemistry also influence the attractiveness of men and women to mosquitoes and other vectors.

On the other side of the equation, gender factors play a role in susceptibility to vector-borne infections. Behavioural, occupational and cultural differences lead to gender differences in vector exposure, use of personal protection measures and health seeking practices.

This presentation highlights sex discrepancies in infections transmitted by mosquitoes and ticks and places this evidence in context in terms of physiological factors and gender-specific behaviour.

http://dx.doi.org/10.1016/j.ijid.2014.03.557

Type: Invited Presentation

Final Abstract Number: 31.003
Session: Gender Differences in Infectious Diseases
Date: Saturday, April 5, 2014
Time: 10:15-12:15
Room: Room 1.60

Gender differences in tuberculosis

A.E. Thorson

Karolinska Institute, Solna, Sweden

Tuberculosis shows marked differences between males and females in terms of detection and notification, progression to disease after infection and disease outcome, as well as the social consequences of the disease. Both biological sex and socially constructed gender differences are important determinants of tuberculosis and they interact to produce differences in risks and vulnerability. Furthermore, these factors interact with other social determinants to effect health outcomes. The social structure of many societies in low-income countries today relies on women having a double or triple workload, including household,